

REMARKS

Status of the Claims

Upon entry of the amendment above, claims 1 and 3-48 will be pending in this application.

Of the pending claims, claims 11-24, 34-46, and 48 are nonelected and withdrawn from consideration. Of these nonelected and withdrawn claims, claims 15, 38, and 48 are independent.

Of the pending claims, claims 1-10, 25-33, and 47 are elected. Of these elected claims, claims 1, 25, and 47 are independent.

Rejection of claims 4 and 28 under 35 U.S.C. § 112, Second Paragraph for Indefiniteness

In accordance with the Examiner's comments, "methylphenylphosphonium" has been corrected to ---methyltriphenylphosphonium--- in claims 4 and 28, and at page 24 of the specification. The "methylphenylphosphonium" at page 16 of the specification, not noted by the Examiner, has also been corrected to ---methyltriphenylphosphonium---.

Rejection of claims 1, 9, 10, 25, 32, and 33 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,286,570 (SCHLUETER, JR. et al.)

With claim 1 being amended - to identify the at least one charge control agent as being a polyol that is copolymerizable with the polyisocyanate prepolymer, the polyether polyol, and the hardener mixture - this recitation by itself distinguishes claims 1, 9, and 10 over SCHLUETER, JR. et al. Claim 25 as originally presented defines the at least one charge-control agent as being copolymerizable with the polyisocyanate prepolymer, the polyether polyol prepolymer, and the hardener mixture, such that the charge control agent is covalently bonded to the polyurethane elastomer; this recitation correspondingly distinguishes claims 25, 32, and 33 over SCHLUETER, JR. et al.

SCHLUETER, JR. et al. does not teach the use of a copolymerizable charge control agent, as is recited in Applicants' claims 1, 9, 10, 25, 32, and 33. The SCHLUETER, JR. et al. charge control agent remains mobile in the polyurethane elastomer, with the agent's mobility being reduced by its asymmetry and the high degree of crosslinking that characterizes the elastomer (column 2, line 65 through column 3, line 1; column 4, lines 36-40). The charge control agent of SCHLUETER, JR. et al.

accordingly is not covalently bonded to the polyurethane elastomer; and particularly, it is not a polyol.

For the foregoing reasons alone, claims 1, 9, 10, 25, 32, and 33 are not anticipated by SCHLUETER, JR. et al.

Rejection of claims 1-10, 25-33, and 47 under 35 U.S.C. § 103(a) as being unpatentable over SCHLUETER, JR. et al. in view of U.S. Patent No. 4,729,925 (CHEN et al.) and European Patent Application No. 0 604 334 (RAMOS et al.)

Both SCHLUETER, JR. et al. and CHEN et al. do address the problem of charge control agent depletion. However, they deal with this problem in two different, and in fact unrelated, ways; moreover, in doing so they use different and unrelated agents.

In this regard, SCHLUETER, JR. et al. combats depletion, as has been noted, by employing a highly crosslinked polyurethane elastomer and a mobile but highly asymmetric charge control agent; the inhibition of depletion results from this crosslinking and asymmetry. However, CHEN et al. uses a completely different and unrelated means for dealing with loss of charge control agent; specifically, CHEN et al. actually attaches the charge control agent to the elastomer - specifically, by copolymerizing the charge control agent with the other reactants, in making the polyurethane (column 2, lines 25-32). In contrast to SCHLUETER, JR. et al., CHEN et al. does not teach or suggest the use of

elastomer crosslinking and charge control agent asymmetry for inhibiting agent depletion.

Correspondingly, the charge control agents of SCHLUETER, JR. et al. and CHEN et al. are completely unrelated. The SCHLUETER, JR. et al. agent is an asymmetric quaternary ammonium sulfate salt of specified formula, and that of CHEN et al. is a polyol, also of specified formula.

Accordingly, SCHLUETER, JR. et al. and CHEN et al. indeed do employ completely different and unrelated means to effect charge control agent retention, and completely different and unrelated charge control agents for accomplishing this result. Therefore, the teachings of SCHLUETER, JR. et al. and CHEN et al. provide no motivation for using the charge control agents of CHEN et al. in the SCHLUETER, JR. et al. polyurethane elastomer.

As to RAMOS et al., this reference discloses a polyurethane elastomer copolymerized with polyol charge control agent, having a shore A hardness of from about 15 to about 40, and employed with particle transfer rollers used to clean moving webs (page 3, lines 1-2; page 4, lines 4-8 and lines 29-30). RAMOS et al. teaches that the CHEN et al. transfer roller is unacceptable for use as a particle transfer roller, because it has too high a durometer - in the range of 40-90 Shore A (page 3, lines 19-25).

CHEN et al. indeed does teach a hardness of about 40-90 Shore A (column 9, lines 36-39). SCHLUETER, JR. et al. correspondingly discloses a Shore A harness range of from 60 to about 95 (column 4, lines 55-61; column 5, lines 15-20). In any event, RAMOS et al. fails to supply the previously noted deficiency in motivation. On this basis alone, claims 1-10, 25-33, and 47 are patentable over the combined teachings of SCHLUETER, JR. et al., CHEN et al., and RAMOS et al.

CONCLUSION

It is respectfully submitted that, for the reasons as stated, the claims presently pending in this application are patentable over the art of record. It is further respectfully submitted that the application is otherwise in condition for allowance.

Withdrawal of the restriction requirement and the rejections, and allowance of all pending claims, is respectfully requested. It is further respectfully requested that this allowance be set forth in the next Official Action for the Application.


Favorable action is respectfully solicited.

No.10113.A01
PAT00018.A01

The Commissioner is authorized to charge any additional amount or fee required for acceptance of this reply as timely and complete to Deposit Account No. 50-1381.

Should the Examiner have any questions or comments regarding this matter, the undersigned may be contacted at the below-listed telephone number.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph at page 16, lines 15-18 has been amended as follows:

A preferred charge-control agent is [poly(oxy(1-oxo-1,6-hexanediyl)),alpha,alpha'oxydi-2,1-ethanediyl)bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methylphenylphosphonium] poly(oxy(1-oxo-1,6-hexanediyl)),alpha,alpha'oxydi-2,1-ethanediyl)bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methyltriphenylphosphonium salt available from Eastman Kodak Company of Rochester, NY.

? *matched brackets* ?

The paragraph at page 23, line 25 through page 24, line 17 has been amended as follows:

The liquid precursor employed in Examples 1-5 consists of a mixture of three liquid starting materials described as follows:

A. a polyisocyanate prepolymer, which is a polymethylene-bis[4-cyclohexyl diisocyanate] (VIBRATHANE® B635 polyisocyanate pre-polymer obtainable from Uniroyal Chemical Company);

B. a polyether polyol prepolymer, which is a polytetramethylene ether glycol (TERATHANE® polyether glycol obtainable

from E.I. duPont de Nemours and Co. of Wilmington, DE) having a weight average molecular weight of 1000 g/mole; and

C. a hardener composition mixture consisting of

- a) 74 wt%, based on total weight of the hardener mixture, of a polyol cross-linking agent (TP 30 obtainable from Perstorp Polyols, Inc. of Toledo, OH);
- b) 25 wt%, based on total weight of the hardener mixture, of a dicarboxylate charge-control agent as disclosed in U.S. Patent 4,729,925 [specifically [poly(oxy(1-oxo-1,6-hexanediyl)), alpha, alpha' oxydi-2,1-ethanediyl]bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methylphenylphosphonium] poly(oxy(1-oxo-1,6-hexanediyl)), alpha, alpha' oxydi-2,1-ethanediyl]bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methyltriphenylphosphonium obtainable from Eastman Kodak Company of Rochester, NY]; and
- c) 1 wt%, based on total weight of the hardener mixture, of triethylenediamine as catalyst.

*amended
brooks*

In the Claims:

The claims have been amended as follows:

Claim 2 has been cancelled.

1. (Amended) A polyurethane elastomer comprising the reaction product of:

a polyisocyanate prepolymer formed by reacting an isocyanate with a polyol, said polyisocyanate prepolymer being present in an amount of from 45 to 70 weight percent based on total weight of the elastomer composition;

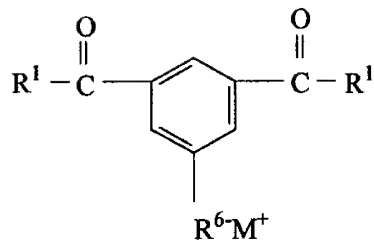
a polyether polyol prepolymer present in an amount of from 25 to 50 weight percent based on total weight of the elastomer composition; and

a hardener mixture comprising at least one additional polyol and at least one charge-control agent, the at least one charge control agent being a polyol capable of being copolymerized with the polyisocyanate prepolymer, the polyether polyol, and the hardener mixture, the hardener mixture being present in an amount of from 1 to 25 weight percent of the total elastomer composition,

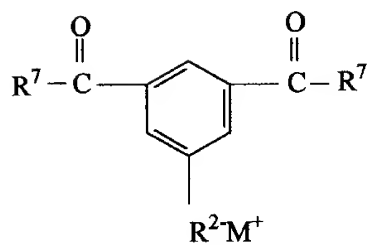
the amounts of the polyisocyanate prepolymer, the polyether polyol, and hardener mixture being selected such that the equivalent ratio of hydroxyl functionality to isocyanate functionality is from 0.96 to 1.04.

3. (Amended) The elastomer of Claim [2] 1 wherein the charge-control agent is a polyol charge-control agent selected from at least one of formula (I) or formula (II):

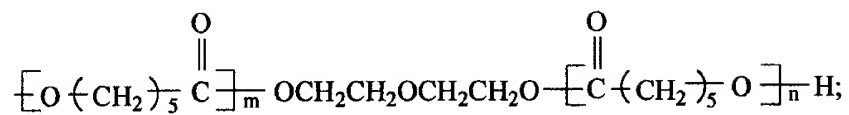
(I)



(II)



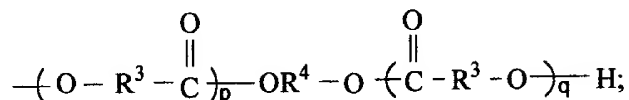
wherein R¹ represents:



R⁶ represents sulfonate, oxyphenylene sulfonate, oxycyclohexylene sulfonate, or p-toluenesulfonamidosulfonyl;

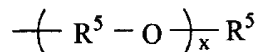
R² represents oxyphenylene sulfonate, oxycyclohexylene sulfonate, or p-toluenesulfonamidosulfonyl;

R⁷ represents:



R³ represents a straight or branched chain alkylene group having 2 to 7 carbon atoms;

R⁴ is the same as R³ or is



R⁵ is the same as R³;

x is 1 to 10;

m and n are integers which together are of sufficient value to achieve an R¹ weight average molecular weight of 300 to 30,000;

p and q are integers which together are of sufficient value to achieve an R⁷ weight average molecular weight of 300 to 30,000; and

M represents hydrogen, an alkali metal, ammonium, or P⁺(C₆H₅)₃CH₃.

4. (Amended) The elastomer of Claim 1 wherein the charge-control agent is [poly(oxy(1-oxo-1,6-hexanediyl)),alpha, alpha' oxydi-2,1-ethanediyl)bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methylphenylphosphonium] poly(oxy(1-oxo-1,6-hexanediyl)),alpha,alpha'oxydi-2,1-ethanediyl)bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate(2:1),ion(1-)methyltriphenylphosphonium.

28. (Amended) The elastomer of Claim 25 wherein the charge-control agent is [poly (oxy (1-oxo-1,6-hexanediyl)),alpha, alpha' oxydi-2,1-ethanediyl) bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methylphenylphosphonium] poly (oxy (1-oxo-1,6-hexanediyl)),alpha,alpha'oxydi-2,1-ethanediyl)bis(w-hydroxy-5-sulfo-1,3-benzenedicarboxylate (2:1), ion (1-) methyltriphenylphosphonium.